

Our review did not include studies of mortality after influenza vaccination, but this topic has received much attention in recent years, especially for individuals aged 65 years or older.^{55,56} A series of observational studies undertaken between 1980 and 2001 attempted to estimate the effect of seasonal influenza vaccine on rates of hospital admission and mortality in such adults.^{57–59} Reduction in all-cause mortality after vaccination in these studies ranged from 27% to 75%. In 2005, these results were questioned after reports⁶⁰ that increasing vaccination in people aged 65 years or older did not result in a significant decline in mortality. Five different research groups in three countries have shown that these early observational studies had substantially overestimated the mortality benefits in this age group because of unrecognised confounding.^{55,61–68} This error has been attributed to a healthy vaccine recipient effect: reasonably healthy older adults are more likely to be vaccinated, and a small group of frail, undervaccinated elderly people contribute disproportionately to deaths, including during periods when influenza activity is low or absent. Recent studies in a northern Californian population addressed this confounding and noted that influenza vaccination decreased all-cause mortality in people aged 65 years or older by 4.6% (95% CI 0.7–8.3) and hospital admissions for pneumonia and influenza by 8.5% (3.3–13.5).^{62,68} These findings suggest that presently licensed vaccines might prevent some serious complications of influenza in the elderly, but not as many as would be predicted based on results of earlier cohort studies that failed to control for confounding.